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Master's Thesis

Helping Friends Suffering Mental Health Issues:
Challenges and Opportunities for Social Support on
Social Media from the Peer's Point of View

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2018

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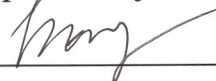
Helping Friends Suffering Mental Health Issues: Challenges and Opportunities for Social Support on Social Media from the Peer's Point of View

A thesis submitted
to the Graduate School of Creative Design Engineering, UNIST
in partial fulfillment of the
requirements for the degree of
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Helping Friends Suffering Mental Health Issues: Challenges and Opportunities for Social Support on Social Media from the Peer's Point of View

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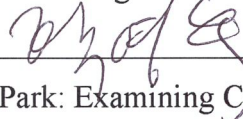
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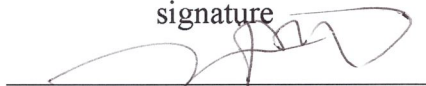
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Abstract

People with mental health problems are increasingly using social media to disclose their experiences or to seek help. Recent research has suggested that peer support plays a critical role in achieving better health outcomes for these individuals. However, little is known about the experiences and perceptions of the peers who are expected to provide this support. In this paper, I investigate how student peers recognize, perceive, and support others who describe mental health-related challenges on social media. Online survey (N=227) and interviews (N=20) revealed that a considerable number of people did not proactively support where they could identify others at risk through stigmatized content, unusual online activities, or a gap between online and offline identity. I found that social stigma, fatigue, and susceptibility often hampered social support. I outline the implications of using social media as a supportive platform, and discuss opportunities for using design to enhance the peers' social support experiences.

Keywords: Mental health; social media; social support; peers; self-disclosure

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1

Introduction

Introduction

College students' mental health is at an all-time low because they are now exposed to a wide variety of stress and pressure (Carlos et al., 2008). These students are also at vulnerable ages which is frequently when first episodes of serious mental health problems appear (Kessler et al., 2007). Increasingly, students are turning to social media to relieve their distress by venting negative emotions or by disclosing mental health problems. Earlier studies have addressed many aspects of mental health-related social media use, including depression displayed on social media (Moreno et al., 2013), the curation of self-harm images on Instagram (Pater et al., 2017), the sharing of pro-eating disorder content on Tumblr (Chancellor et al., 2017), and even suicidal ideation (Choudhury et al., 2017).

Online disclosures open up a new opportunity for building computational models to detect mental-health conditions. For instance, researchers have characterized the unique linguistic patterns of people who have mental health problems by examining posts on the online community reddit (Choudhury et al., 2014). Scholars have also examined social media activities such as Facebook updates to detect signals of loneliness (Burke et al., 2010), low self-esteem (Burke et al., 2011), depressive symptoms (Park et al., 2015), or deficient subjective mental well-being (Kross et al., 2013). Nevertheless, despite the many advances in computational models, few empirical studies have examined how non-professional individuals—who are susceptible to other people's emotions and experiences—perceive online signals from at-risk friends.

Understanding peers' viewpoints regarding mental health-challenged individuals is crucial to empowering social media to serve as a supportive platform. A large body of research has addressed supportive online interactions with peers, which have been shown to help suffering individuals attain improved mental well-being. (Lorraine et al., 2015; Moor et al., 2016; Webb et al., 2008). Thus, researchers have identified the factors that drive online social support (Choudhury et al., 2014) and proposed computing platforms that could promote online peer support for people who are experiencing mental health problems (Leary et al., 2017). Most of the research on peer support has focused on those who seek help and has not taken into account the potential benefits and risks of social support from the peers' perspectives. Thus, we need a better understanding of experiences and challenges that those supporters face when helping someone in need. In this work, I elucidate these peers' perceptions, experiences, and challenges to enhance peer's social support experiences on social media,

Throughout this paper, I use the term peers to refer to the friends or acquaintances of individuals with mental health issues; these individuals and the peers are of a similar age and social status (i.e.,

members of the same student population). These peers may or may not have experienced similar mental health challenges. In this context, peer support includes a variety of interpersonal behaviors that can help fellow students with their mental health problems (Moir et al., 2016). Here, I do not limit the term mental health to refer only to medically diagnosed illnesses. Rather, I consider all kinds of negative emotions and experiences, including those that make people feel vulnerable, including stress, loneliness, and minor depression.

To investigate how peers recognize, perceive, and react to their fellow students' mental health challenges as disclosed on social media, I conducted a survey of 227 peer students and then performed follow-up interviews with 20 of them. Our results revealed a variety of explicit and implicit signals that raised these peers' concern about others' mental health problems. The findings also showed that some peers utilized these perceived signals to provide support and explained how peers chose whether to engage in support. I identified a considerable number of peers who were reluctant to offer support even where they had identified friends who were at risk; this reluctance was due to a lack of knowledge or confidence, emotional fatigue, and the high visibility of support activities. Drawing on these results, I provide design guidelines to leverage the peers' sense-making ability and to provide persuasive interventions to match individual characteristics. I also propose design features that will use collective efficacy to lessen the burden on peers to provide support. These features will also help suffering individuals estimate the impact of negative disclosure.

Our contributions are twofold:

1. I provide a rich description of how peers recognize, perceive, and respond to those who express mental health issues on social media, across a wide range of peer experiences.
2. By providing guidelines for support, I outline opportunities for augmenting social media such that it becomes a supportive platform.

2

Background

- Characterizing Mental Health Problems on Social Media
- Social Support for Mental Health
- Self-Disclosure and Social Support

Background

I organize the related works into categories: 1) the characterization of mental health problems on social media, 2) the use of social support on social media to attain mental health, and 3) the interpersonal impact of self-disclosure.

Characterizing Mental Health Problems on Social Media

Detecting and characterizing at-risk people online is a growing interest in the HCI community. In a large body of research, scholars have investigated how mental health problems are displayed and detected on social media. For instance, some studies found that the symptoms of major depressive episodes can be captured through a content analysis of Facebook status updates (Frison and Eggermont, 2016; Lerman et al., 2016; Moreno et al., 2011; Moreno et al., 2013). Linguistic expression is a strong predictor of mental health problems (Choudhury et al., 2014), but researchers have also investigated whether mental health conditions can be recognized from implicit signals such as social media usage patterns. A study of Facebook revealed that factors such as network size, update frequency, and interaction diversity are correlated with depression (Park et al., 2015). Another study cited social media activity on microblogs such as Twitter as characterizing depression (Choudhury et al., 2013). One researcher found a strong geographical correlation between suicidal tweets and actual suicide rates in the United States (Jashinsky et al., 2014).

Researchers have also focused on image-based communities such as Instagram, where many vulnerable people disclose and signal mental health problems, for example, by posting images that promote eating disorders or that display self-harm can be posted (Chancellor et al., 2016; Part et al., 2015). Researchers also attempt to quantify and predict mental health conditions based on social media use (Gkotsis et al., 2017; Chancellor et al., 2016). Deep-learning informed classifiers showed high accuracy in detecting mental illness-related posts on reddit or Tumblr (Chancellor et al., 2017; Gkotsis et al., 2017). However, such automated approaches are grounded in a large set of aggregated content and thus may not give adequate consideration to individual characteristics and contexts. I thus contend that a better understanding of people's reasoning processes would inspire the development of an algorithm for detecting at-risk people. Thus, I aim to study a variety of peer-perceived mental health-related signals that can be leveraged into further computational algorithms.

Social Support for Mental Health

In this study, I'm interested in the social support provided by peers as they interact on social media

with individuals who display mental health problems. According to a meta-review of the health communication research, individuals benefit from online social media as they interact (Burke et al., 2011), gain access to shared and tailored advice (Webb et al., 2008), and receive informational and/or emotional support from social network members (Wang et al., 2015). Online social media also can provide useful resources for individuals with particular personality traits (e.g., self-esteem issues (Burke et al., 2011) or an Autism spectrum disorder (Burke et al., 2010)) as well as those who are affected by mental illness (Leary et al., 2017). Individuals who experience mental health challenges often struggle to seek help because they feel embarrassed or have a fear of stigma and rejection (Lisa et al., 2006). Online social media provide space for disclosing mental health issues with the benefits of convenience, privacy, and anonymity (Melling et al., 2011; Powell and Clark, 2007); they also allow users to share difficulties and seek emotional support (Moore et al., 2016). Social media helps college students in general (Natalya et al., 2015) and those who are suffering in particular to attain improved mental well-being (Lorraine et al., 2015; Webb et al., 2008). Thus, researchers have identified numerous factors that drive online social support (Choudhury et al., 2014) and have proposed computing platforms that would promote online mental health support from peers (Leary et al., 2017). Despite the demonstrated importance of online social support, researchers have yet to empirically study the motives behind such support from the perspective of the peers who are expected to provide it. I thoroughly investigate the issue from the peer perspective in this paper.

Self-Disclosure and Social Support

I aim to elucidate how a social media disclosure from an individual with a mental health issue affects those who are exposed to the disclosure. Sharing intimate information increases others' affection and trust (Collins et al., 1994), and contact with another person's self-disclosure increases overall positive feelings for the discloser (Collins et al., 1994). Meanwhile, disclosure risks also exist: rejection by the listener, reduction of one's autonomy or personal integrity, loss of control or self-efficacy, and the possibility of hurting or embarrassing the listener (Leslie et al., 1996). People's reasons for online disclosure are associated with 1) identity clarification, 2) relational development, 3) social validation, 4) social control and resource gain, 5) self-expression and relief of distress, 6) information sharing to benefit others, and 7) pleasure (Natalya et al., 2014). Although online self-disclosure activities positively impact the disclosers, a recent study identified certain risks (e.g., self-stigma and reputation damage) of using social technology to find mental health support (Leary et al., 2017). A study of college students revealed that receiving "likes" and gratifying replies from friends is very important to disclosers' emotional contentment, causing them to feel more satisfied (Natalya et al., 2015). However, the recipients of these disclosures often experienced negative effects (e.g., emotional contagion (Kramer et al., 2014)). To understand the contradictory effects of disclosure, it is important to

investigate how the audience perceives the disclosures that signal negative feelings or mental health problems and to determine how such disclosures affect the audience.

3

Methods

- Recruitment
- Phase I: Online Survey
- Phase II: Semi-Structured Interviews
- Analysis
- Ethical Considerations, Reflections, Limitations

Methods

In our study, I aimed to explicate how people—especially students—perceive their friends’ mental health challenges (expressed through social media) and to determine what factors impact these peers’ social support.

To answer these questions, I conducted a two-phase study: Phase I, a large-scale survey, and Phase II, comprising semi-structured interviews. Through an online survey of current students (N=227), I wanted to probe 1) the respondents’ experiences with friends who had signaled mental health issues on social media, 2) the perceived influence of such posts and activities, and 3) the types of support the peers provided, along with their perception of the expected helpfulness of that support. I then conducted semi-structured interviews with 20 of the participants to investigate why and how they decided to support or ignore their friends.

Recruitment

One of our aims was to understand perceptions about and experiences with mental health-related peer support among university students, a significant number of whom experience serious mental health challenges while in school (Carlos et al., 2008). To gain access to the student participants, I used a referral sampling technique whereby gatekeepers who had access to each university community spread the word to individuals via social media and online forums. All undergraduate or graduate students were eligible to participate as long as they were currently seeking a degree or would be matriculating into a degree program soon. Recruitment occurred from March 22 through 31, 2017, at six universities. The recruitment posts featured a link to an online survey and a consent form. Participants were added to a raffle for a \$5 gift card as compensation for their efforts. I randomly sampled 20 online survey participants who offered their email addresses as an expression of interest in a follow-up interview (n=102). With this group, I conducted fourteen face-to-face interviews and six phone interviews, according to the respondents’ preferences. The interview participants received \$10 in cash as compensation.

Phase I: Online Survey

All survey participants were provided both demographic questions and semi-open-ended questions, the latter of which allowed them to select multiple responses and to enter text if necessary. In this way, the participants answered questions about 1) whether they had witnessed a person signaling mental

health problems on social media, 2) why they were concerned about that person's mental health, 3) what their relationship was with that person, and 4) what type of response they provided. The participants were also asked to answer several questions about their perceptions using a 5-point Likert scale. I iteratively developed the questionnaire items based on existing literature to examine the factors that influenced feelings of willingness or unwillingness to respond to such disclosures (Prosser et al., 2015): Closeness (Burke et al., 2016): To what extent did you feel that you were close with the person you mentioned above? Responsibility (Fraley et al., 2011): To what extent did you feel that you should respond to that person? Susceptibility (Forgas et al., 2011): How did that person's disclosures or other activities influence your emotions? Helpfulness (Fraley et al., 2011): To what extent did you feel that your response or support would be helpful to that person?

Phase II: Semi-Structured Interviews

I conducted follow-up interviews with 20 of the survey participants to elucidate the perceptions, opportunities and challenges of social support from the peers' perspectives. Specifically, I wanted to elicit detailed and accurate narrative accounts of peers' experience. These interviews lasted between 40 to 60 minutes. To help them recall past experiences, I asked the peers to browse their own social media accounts. I asked them to tell us about some posts and activities that may have signaled that an individual was facing mentally challenging situations, such as Facebook messages or Instagram images that reflected unstable mental health conditions (e.g., depressive states, suicidal ideations, or requests for help). We then asked the peers how they reacted to the posts and how that experience impacted their perceptions of the poster and their chosen methods of support.



Figure 1. Semi-Structure Interview

Table 1. An overview of interview participants

| Interviewer | Participant code | Gender | Age | Degree course |
|-------------|------------------|--------|-----|---------------|
| 1 | P_41 | F | 24 | Undergraduate |
| 2 | P_67 | F | 23 | Undergraduate |
| 3 | P_51 | M | 21 | Undergraduate |
| 4 | P_63 | M | 24 | Undergraduate |
| 5 | P_13 | F | 20 | Undergraduate |
| 6 | P_69 | F | 27 | Graduate |
| 7 | P_153 | M | 24 | Undergraduate |
| 8 | P_59 | F | 22 | Undergraduate |
| 9 | P_72 | M | 24 | Undergraduate |
| 10 | P_75 | F | 22 | Undergraduate |
| 11 | P_42 | F | 26 | Graduate |
| 12 | P_34 | M | 28 | Graduate |
| 13 | P_29 | M | 23 | Undergraduate |
| 14 | P_40 | M | 23 | Undergraduate |
| 15 | P_116 | F | 22 | Undergraduate |
| 16 | P_78 | M | 24 | Undergraduate |
| 17 | P_120 | M | 23 | Undergraduate |
| 18 | P_94 | F | 21 | Undergraduate |
| 19 | P_119 | F | 27 | Graduate |
| 20 | P_122 | F | 25 | Graduate |

Analysis

I analyzed the survey questions, which had single-selection, multiple-selection, and Likert-scale responses, using descriptive statistics. I also examined the responses to the open-format survey questions and the interview transcripts using inductive thematic analysis (Virginia et al., 2006). Two researchers independently coded the responses and transcripts to iteratively formulate possible themes and then compared their codes. The coding process was recursive, and it ended when the researchers considered the themes to have stabilized, until a set of distinct themes emerged.

Ethical Considerations, Reflections, Limitations

I did not investigate the “posters” those who produced the references to mental health issues because our primary research focus was on understanding the perspective of the “peers” those who were concerned about the posters. Thus, I did not directly interact with highly vulnerable individuals who might have mental-illness diagnoses. However, I acknowledge that mental health problems are very

common among students. Thus, it is quite likely that some of the peer participants also have struggled with undiagnosed disorders (e.g., depression), given the crisis regarding such disorders that has struck college campuses nationwide (Pedrelli et al., 2015). Note that during the interview, three of participants indicated that they were diagnosed with major depressive disorder

Due to the sensitive nature of the topic, after discussing the likelihood of interacting with vulnerable populations, I worked closely with a psychiatrist and two counselors at a university's healthcare center. These experts thoroughly scrutinized our online survey's questions and our interview protocols. I also organized several discussion sessions in which researchers and experts exchanged ideas about the study's preliminary findings.

To reduce the chances that our participants (peers) would identify the original posters, I asked the participants not to show or tell us any identifying information about the posters (e.g., their names or social media accounts). To protect our participants' identities, I also used pseudonyms when reporting their quotes and did not provide the details of their demographics.

I acknowledge that it is possible to misunderstand or misrepresent a poster's actual experience, as I derived our findings from peers' anecdotal observations. I were not able to determine whether the posters that our participants mentioned had actually been experiencing mental health issues or whether the reported activities were actual signals of mental illness. Prior to the data analysis, two coders from our research team were trained to apply codebooks that had been used in previous studies (Andalibi et al., 2017; Moreno et al., 2011; Moreno et al., 2013). The coders also reviewed the DSM-5 criteria for major depressive experiences and iteratively developed a new codebook that combined keywords from the codebooks and the DSM-5 criteria. However, our study did not focus on finding general factors to recognize or predict mental health conditions. Rather, our attention was on characterizing references to mental health concerns regardless of the posters' diagnostic states. I reported empirical evidence regarding the peers' perceptions of the signals from the posters' disclosures. By acquiring ground truth data, future study should address what factors affect the possibility of peer's correct detection or false alarm.

Finally, researchers in the HCI and CSCW communities have discussed the vulnerability involved in exploring sensitive topics (Moncur et al., 2013). I'm aware that collecting, coding, and analyzing emotionally challenging data can affect researchers, so those in this study were strongly encouraged to reflect on their feelings with other researchers and experts at weekly meetings and to occasionally take breaks from their work so as not to immerse themselves in the data.

4

Survey Result

- Demographics
- Type of Disclosure Displaying Mental Health Issues
- Type of Reactions or Support
- Peers' Perceptions that Can Affect Support
- Summary

Survey Result

Demographics

The survey participants comprised 227 students from six institutions of higher education in a single country. They included undergraduate students ($n=179$), master's students ($n=21$), PhD students ($n=17$), and unspecified others ($n=10$). By gender, ninety-one (40.3%) were male, 134 (59.7%) were female, and two were not specified. Most respondents were between 19 and 25 years old ($M=22.4$; $SD=2.6$). The survey began with the question, "Have you ever seen a person whom you know displaying signs of a mental health problem on his/her social media?" The majority of survey respondents (75.3%; $n=171$) reported that they had seen such activities, either from individuals they personally knew (86%) and those they did not personally know, such as a common friend on Facebook (14%).

Some participants ($n=18$) referenced their friends who had been diagnosed with mental illness including major depressive disorder ($n=9$), schizophrenia ($n=1$), eating disorder ($n=1$), post-traumatic stress disorder ($n=1$), anxiety disorder ($n=2$), unspecified ($n=4$).

Types of Disclosures Displaying Mental Health Issues

Respondents found that the media the posters used were mostly text messages (88%), with some images (5%) and other types of content such as shared links (7%). These posts reflected each poster's negative feelings, stigmatized experiences, or moods, and they made him/her appear to be suffering. For instance, P77 perceived a friend's Facebook post, which contained a photograph of a celebrity who had died by suicide, as an implicit suicidal ideation. In addition, 19 percent of the respondents identified signs of mental health problems by tracing a poster's activities over time, such as a constant liking of content mentioning depression (P59) or a sudden burst of Facebook updates (P29). The detailed reasons for how and why these respondents became concerned about the posters' mental health conditions are reported in Table 1 in the Qualitative Analysis section.

Types of Reactions or Support

After taking a closer look at the types of reactions that the peers provided to the posters, I found that more than half of the survey respondents (57.9%, $n=99$) did not respond to the posts or provide any other support even though some ($n=22$) still had concerns. Of those who reacted to the posts, 30% expressed their emotions using simple communicative features of social media (e.g., the "Like" button

options or crying emoticons); 18.7% wrote short comments on the posters' social media feeds to express support (e.g., "It will get better."); 15.8% sent private messages directed to the posters; 7% made appointments to meet with the posters; 2.9% offered specific advice; and 1% researched resources on behalf of the posters (e.g., by calling a counselor).

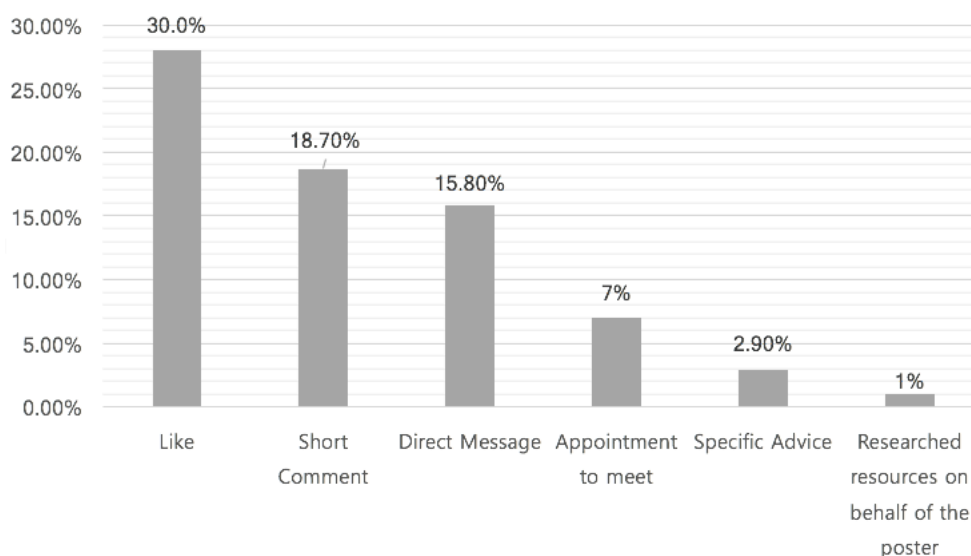


Figure 2. Type of reactions and supports

Peers' Perceptions that Can Affect Support

As I reported above, over half of the respondents did not provide support. Thus, I wanted to consider how these peers differed from those who did react. To do this, I characterized four properties of peer perception, rated on a 5-point scale, including perceived responsibility, perceived closeness to the poster, perceived helpfulness, and susceptibility to the poster's emotion. The average scores for these perception properties was higher for peers who provided support than for those who did not. To determine whether there were significant differences between the two groups, I conducted a Mann-Whitney U test (two-tailed, reported with a z score and a p -value). I found that peers were significantly more likely to support others if they felt more responsible ($z=-5.18$ $p<.000$), were closer to the poster ($z=-3.98$ $p<.000$), or believed that their support would be helpful ($z=-5.07$ $p<.000$). Susceptibility did not affect the likelihood of providing support ($z=-1.30$ $p=.19$). There was no significant difference between male and female peers.

To provide a better context the factors that impact peer support, I examined the correlations between all the peer-perception properties. I found that perceived responsibility and susceptibility were positively correlated ($r=.31$), indicating that peers who are susceptible to each other's emotions may feel more responsibility to react to posts. I also found a weak, positive correlation between perceived

closeness and perceived responsibility ($r=.30$), which indicates that peers may feel more responsible for taking care of those to whom they feel close. Perceived responsibility was also positively, but weakly, correlated with perceived helpfulness ($r=.22$). I could guess that reactions and support that are grounded in responsibility impact the peers' confidence regarding the help they are providing. I also found a weak, positive correlation in the relationship between helpfulness and closeness ($r=.22$), indicating that peers may expect their contributions to be helpful when providing them to people to whom they feel close to. Almost no correlation was found between perceived closeness and influence ($r=.09$) or between perceived helpfulness and influence ($r=-.03$).

Summary

Overall, I made three observations about peer support. First, the majority of participating students had experienced the identification of others' mental health conditions through disclosures on social media. The content (e.g., text messages, images, or shared news), which was generated by individuals who appeared to suffer from mental health problems, was a primary indicator. The peers inferred their friends' mental health states by observing social media activities (e.g., by analyzing the timing and frequency of updates). Second, despite the high prevalence of these disclosures, more than half of the participants did not respond to the mental health disclosures. Even for those who did react, most of the reactions they provided involved simple forms of communication (e.g., sending a like or writing a short, cheerful message). Third, the peers' perceived responsibility, their closeness to the posters, and their perceptions of the expected results of their support all impacted the likelihood that they would provide social support. Although the peers' susceptibility did not immediately affect their support, it may have triggered feelings of responsibility.

Building upon the results from the survey, I was interested in which signals the peers utilized in recognizing their friends' mental health conditions; in how they attempted to provide support; and in why so many of them decided not to react to the posters despite being aware of problems. Keeping these high-level findings in mind, I move on to the interview data, through which I aim to understand the detailed contexts in which these patterns occur.

5

Qualitative Analysis

- RQ1. How do peers discern their friends' mental health problems through social media content and activities?
- RQ2. In what ways do these peers provide support for their friends?
- RQ3. What are the consequences of viewing posts that reveal mental health condition on social media? And, what factors affect peers' support?

Qualitative Analysis

Our findings indicate that the participants based their perceptions of others' mental health conditions on a variety of signals (see Table 1). Many participants used the communicative features of social media to help their friends who appeared to be suffering from mental health issues. I also identified several challenges that led to most peers refraining from providing such support. I organized our findings by answering our research questions.

RQ1. How do peers discern their friends' mental health problems through social media content and activities?

Our participants cited a number of signals that led them to believe that their friends might be suffering. These ranged from explicit references such as mood disclosures in social media content to implicit references such as inconsistent offline and online personality traits. Table 1 summarizes these signals, gives a detailed description of each one, and lists examples provided by both survey and interview participants.

Disclosed Mood and Diagnostic History

The explicit disclosure of negative emotions provided a clear signal that led our participants to become concerned about a poster's mental health. The disclosed moods included feeling exhausted and overwhelmed (n=37, 21%), depressed (n=35, 20%), lonely (n=19, 11%), angry (n=15, 8%), hopeless (n=9, 5%) and, other (n=6, 3%). Two interview participants responded that a poster's symptoms appeared to be serious if s/he displayed negative feelings without a detailed explanation for such feelings.

"She [a poster] updated her Facebook like, 'I'm useless. There's no reason for why I have to live.' [...] When I saw this post, I felt she was at risk though she never gave a reason for saying this. It seemed like a very conclusive remark. That caused me to be really worried about her." (P67)

Table 2. Signals that raised our participants' concern about others' mental health problems

| References to Mental Health Concerns | Detailed Descriptions |
|---|---|
| | Examples of Quotes or Cases Reported |
| Disclosed Mood and Diagnostic History Survey: n=121; 70% Interview: n=15; 75% | Negative mood from depressive symptoms to suicidal feelings Use of swearing or abusive or offensive language Disclosure of mental illness diagnosis (e.g., alcohol problems, anxiety disorder) and experiences or desire for treatment such as counseling or medication <i>"He wrote he's seeking information about a psychiatric service on campus because he was not getting along well at school." –P140</i> <i>"My friend's post, 'I'm a loser. I feel I will never be successful' with no details frightened me." –P34</i> |
| Personal Life Struggles and Stigmatized Experience Survey: n=53; 30% Interview: n=9; 45% | Describe severe difficulties/challenges that negatively impact a poster's life (i.e., family disruption, romantic breakups, interpersonal difficulties, and personal concerns) <i>"He considered dropping out of college due to feeling overwhelmed." –P141</i> <i>"After breaking up with his girlfriend, he expressed how he felt devastated every night." –P88</i> |
| Encoded Contents Implying Mental Health Problem Survey: n=10; 6% Interview: n=4; 20% | Implicit signals, such as the use of literary references or visual images implying mental health problem <i>"My 'bro' writes many songs. He often posts very dark and macabre lyrics. Sometimes, he posts a video streaming of himself singing that song. It seems weird." –P51</i> <i>"It was a poem about death. She kept posting such things on her Instagram." –P69</i> |
| Gaps between Offline and Online Identity Survey: n=22; 13% Interview: n=4; 20% | Gap between online identity appeared to format odds with his or her offline identity. <i>"I felt that it was written by a totally different person. The tone in the post was completely different from what he used to be like." –P115</i> <i>"It feels like a 'drunken facebooking.' As far as I know, he's always sober. He never drinks." –P63</i> |
| Social Interaction and Activity Log Survey: n=29; 17% Interview: n=6; 30% | Constant usage of social media as a forum for expressing negative feelings A drastic change of social media activities (a sudden burst of Facebook updates) and unusual communicative patterns <i>"He always shares such a depressive thing every day. He is 'liking' a tremendous number of things that are extremely negative." –P29</i> <i>"He's weird. He writes things that no one cares about. If there's no reply, he then deletes his post. I have seen this [his repetitive posting and deleting activity] happening so many times." –P12</i> |

In addition, participants interpreted posts reflecting extreme anger and hostility, such as those containing swear words or abusive and offensive language, as an explicit signal of an unstable mental condition. According to a prior study (Beverly et al., 1996), anger can be associated with mental health variables. One interview participant provided the example of her best friend who got a new part-time job at a “kid-friendly” café where she faced a lot of challenging situations she had never experienced before.

“It happened after she got a new job. She began to say F-words in her Facebook posts. I saw a couple of explosive outbursts of her anger on Facebook. It seemed that she did not know how to deal with her emotions. I guess it was because she was just overwhelmed by child customers. I felt sorry for her as she kept uploading inappropriate posts.” (P59)

Personal Life Struggles and Stigmatized Experiences

Our participants also considered the disclosure of negative experiences as a reliable source for confirming a poster’s unstable mental state. They shared examples of experiences that made the poster seem vulnerable, including disclosures of interpersonal strife (n=18), low academic performance (n=9), relationship breakups (n=3), family issues (n=2), financial hardship (n=2), and other challenges (n=19). While our participants tolerated superficial mood disclosures, they had their own yardsticks for determining whether a poster was serious.

“Too much disclosure—for instance, talking about upsetting childhood memories of a parent’s abuse—causes me to be worried about the poster ... because I have no idea why posters disclose such a sensitive and private matter in such a public forum. I wouldn’t do that. So, if they post such a stigmatized experience, this could be serious and perhaps a signal of ‘help me.’” (P107)

Encoded Content Implying Mental Health Problems

Disclosures about negative moods, diagnostic history, and stigmatized experiences were often used to recognize the state of a poster’s mental health, but some participants cited more implicit signals, such as the use of literary references or visual images.

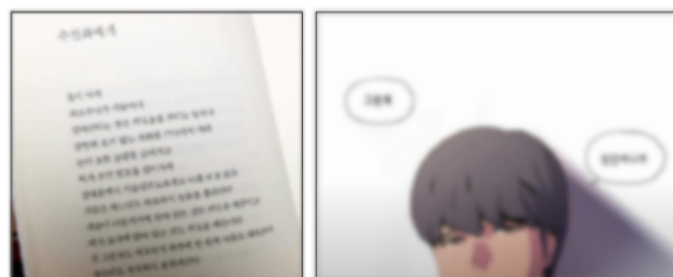


Figure 3. Examples of re-created postings based on interviews

“She did not express her feelings. Instead, she just posted a quote about suicide by French novelist Maurice Barrès. It was ‘To commit suicide is to believe that there is something serious in the world.’” (P69)

Participants captured signals not only from verbal expressions but also from visual imagery, as studied in (Nazanin et al., 2017). For instance, one participant discerned his friend’s suicidal ideation by identifying an Instagram image of a celebrity who had committed suicide (P55). In addition, some incomprehensible posts that were totally out of context caused concerns about the poster.

“It was a post that I could not understand. It seemed to be a weird poem, written by a machine. I could not understand what it was intended for. Well, such a post horrified me.” (P62)

A Gap Between Online and Offline Identity

In our survey, most of our survey participants (86%) reported having a personal relationship with the suffering individuals in real life (e.g., a roommate). Thus, our participants already had constructed an identity for the poster through offline interaction. However, if they recognized that the poster’s online identity was at odds with his or her offline identity, they became concerned. Such an identity gap could be revealed through the use of language that a poster had never used offline. Participants also felt that a poster must be insecure if there was a difference between what the poster said offline and what s/he was saying online.

“As far as I know, my friend is a very kind and positive person. He loves his friends. He has often told me that sincere friendships are the most important thing in his life. However, I just found a sudden update on his Facebook saying that his life was meaningless. I felt like he was a totally different person online.” (P84)

Inconsistency between offline and online activities during a certain period also triggered a concern about a poster.

“We [the participant and the poster] were hanging out with a couple of other friends at karaoke. She seemed okay to me. Honestly, I am sure she enjoyed herself. But, while we were singing a song together, she wrote on Facebook about her negative feelings. I was a bit terrified.” (P59)

Social Interaction and Activity Log

A series of social media data can provide a window for understanding an individual’s usage pattern and motives for usage (Koc et al., 2014). Based on a long-term observation, one participant perceived that his friend’s main objective for using social media was to have a forum for expressing her

depressive symptoms. Additionally, our participants pointed to a high frequency of updates as one source of concern. This finding is consistent with the results of a prior study that revealed that a depressed user group showed an increased rate of wall posts (Park et al., 2015). In this regard, the participants did not rely on a single post but rather made an inference by observing a poster's usage characteristics over a longer time period.

“He always shares his negative feelings, but no one reacts to him: no likes, no comments. If there's no response for a couple of days, he then deletes the original post. He has done this kind of thing many times as far as I can tell.” (P13)

The open nature of today's social media affords the opportunity for observing another's micro activities (e.g., the Facebook ticker that shows a user's commenting, liking, and sharing activity). Thus, our participants often recognized and even tracked the micro activities of a concerning individual.

“Whenever I turned on Facebook, she was doing something. She wrote a post, then commented on the post herself, like a monologue.” (P59)

“This person always presses ‘like’ on all kinds of negative matters and shares news related to depression. So, I have become aware that he might have a problem.” (P20)

RQ2. In what ways do these peers provide support for their friends?

Social media was used as a mediating tool to recognize others' mental health problems and to help them in various ways. I reported the general landscape of social support from peers in our survey result section. In this section, I give our attention to identifying types of support that peers could offer exclusively through social media.

Just-in-Time Support through Personalized Information

Our participants used social media to track whether someone they care about might be suffering from a mental health problem and even to provide support in a timely manner. When participants detected a problem, they leveraged their background knowledge about the poster to respond. For instance, one participant, whose friend was struggling with an eating disorder, reported an example of how she could help her friend.

“She looks okay on her Instagram, but I'm the only one who knows that she's struggling with an eating disorder. So, whenever she posts food images, such as sushi or cakes, I really worry about her. Others would think, ‘Oh, it looks delicious and she might want to share her happy moment with others.’ But I cannot think that way. So, I call her immediately.” (P67)

Another participant talked about his former roommate, who suffered from depression and kept uploading pictures of luxury goods such as cars and watches.

“Before we became closer, I disliked him because he seemed to be obsessed with such luxury items. I thought he was trying to brag. One day, he told me that he’s living with depression and browses such images whenever he gets depressed to feel better. After this special disclosure, I could open my mind. I also call him if he starts uploading images because I know he’s suffering.” (P78)

Seeking Coping Resources Together

Our participants acknowledged that it was difficult to talk with a poster about his or her mental health issues even if they were close to the poster. I found that some participants contacted a poster’s family member or close friend if they noticed the poster was at risk. Two of the participants detected an implicit signal of suicide in their friends’ posts. One directly called the friend’s sister, and the other one sent a direct message to the friend’s family member.

Some participants encouraged their friends to seek help and coping resources. Rather than trying to pressure their friends into treatment, they deliberately approached them with information.

“She posted something that implied suicidal ideation, but I could not say, ‘You have a problem. You should go to the center.’ Instead, I asked her, ‘why don’t we go to the counseling center? I feel I am overwhelmed. I want to go there with you.’” (P94)

This participant sought to help her friend in a way that would make her feel comfortable. In turn, she was thankful that her friend was able to be diagnosed with depression and began regularly visiting a psychiatrist.

Several participants were reluctant to directly refer their friends to a counseling center without the friend’s permission. Two participants who each noticed a friend’s need for mental health care instead approached experts to ask how they should react and how they could bring their friends to the center for help.

RQ3. What are the consequences of viewing posts that reveal mental health condition on social media? And, what factors affect peers’ support?

In contrast to the discerning peers who carefully supported suffering individuals in a timely manner, a considerable number of our participants did not proactively provide support even when they noticed friends at risk. About 56% of participants did not respond to a poster or posts displaying mental health

issues. Because social support from peers is an important factor in obtaining better mental health outcomes (Kim et al., 2014), I examined what prevented these peers from providing support.

Fatigue and Social Stigma

Constant displays of negative feelings and experiences resulted in audience fatigue. Such fatigue could result in a high threshold for concern, meaning that peers could become less troubled by those who kept expressing problems. Also, an individual's disclosure of such negative aspects could lead to a negative stereotype or a fixed identity for the person as someone who is always depressed.

"If you know someone who keeps disclosing negative feelings on Facebook, you'll say, 'well, that is what he always does. A blue guy.' So, no matter how serious he is, [such repetitive behavior] will be likely to mute the signal." (P72)

Participants reported that such fatigue often led them to "unfollow" or even to end a friendship with the poster. One participant reported that he blocked one of his friends who "contaminated" his news feed with all negative matters.

"I am quite sick and tired of his trolling activities every day. Of course, he seems insecure and needs an expert's help, but it's none of my business. So, I blocked him to keep my Facebook feed clean." (P120)

Emotional Contagion

Similar to the results of a large body of studies suggesting that negative feelings or attitudes are likely to spread to others (Kramer et al., 2014), 36.2% of survey participants reported that they were affected by a post displaying negative feelings and experiences. One participant, who had recovered from an anxiety disorder, said he tries to avoid any negative content because he is highly vulnerable. Thus, he decided to stop following a friend who kept liking content related to depression.

"He always shares news and information about depression on all his social media channels. So, I am being affected by his social media activity even though I do not interact with him." (P116)

Lack of Knowledge and Confidence

Some participants said that they did not want to directly interact with someone who might need mental health care due to their own lack of expertise and confidence. One participant reported that he had no idea what to say and argued that even an indifferent response would be worse than no response.

"I am still not sure whether I could help others.... I don't know anything about mental health. I can't even say something like 'hang in there,' because I'm afraid that my naïve response may hurt someone who needs serious care." (P13)

While participants could recognize posters' signals of being at risk, it was not always easy for them to take action in response. They experienced feelings of guilt about watching another's social feed reflecting private matters. Thus, one participant decided to remain silent.

"Note that I am neither a stalker nor a lurker. But her unusual social media activities often catch my eye. Seeing what others are doing online is like reading another person's diary. So, unless requested, I won't respond. I will be quiet." (P67)

High Visibility of Support Activities

The fact that responses might be visible to everyone was also one of the major reasons why participants were reluctant to provide support.

"I think I have never commented on others' posts disclosing mental health problems. I don't want to broadcast like, 'hey, I am helping someone!'" (P69)

Participants were also aware of the possibility that the poster's mental health problems could be highlighted or revealed if they commented or liked a post that signaled a problem.

"We [the participant and the poster] have a lot of mutual friends on Facebook. I know he's suffering from a mental health problem, but he has not talked about it to others. I can see that some posts are signaling his vulnerability, but I never reply to them because my reply could stigmatize him." (P15)

Furthermore, participants were concerned that if they liked or commented on a negative post, they would be viewed as a person who had suffered similar experiences.

6

Discussion

Discussion

Our online survey and interview studies provided a rich description of peers' perceptions of social support for people who appear to experience mental health problems. The disclosing nature of social media helps both those individuals in seeking support and their peers in detecting risk signals. Peers discerned others at risk on social media by synthesizing a variety of signals ranging from explicit disclosures to implicit signals. Recognition of the signals motivated some peers to deliberately intervene in problematic situations in a timely manner and persuade their suffering friends to seek help from experts. Here, I first highlight unique contributions of the peers in helping the suffered students on social media.

However, as I indicated, a significant percentage of the peers remained inactive due to a lack of confidence and knowledge about mental health, as well as fear of the high visibility on social media, fatigue and social stigma caused by repetitive disclosures of sensitive, personal information. Thus, I propose design opportunities to enhance peers' social-support experience.

Leveraging Peers' Unique Abilities to Help the Suffered Students on Social Media

In the following discussion section, I will highlight unique abilities of the peers in helping others on social media in two parts: 1) Peers' ability to discern others at risk on social media by synthesizing a variety of signals., 2) peers' responses to deliberately intervene in problematic situations in a timely manner and persuade their friends to seek help from experts. Finally, design implications for leveraging such peers' abilities to help the suffered students have been suggested.

Spotting the Sign

Our findings confirmed that people identify vulnerable individuals through online content and activities pertaining to interaction patterns (Burke et al., 2011), social capital (Park et al., 2015), emotions (Moreno et al., 2013), and linguistic style (Choudhury et al., 2013). Research on sensitive disclosures has also characterized corpora of text (Moreno et al., 2013) or imagery (Nazanin et al., 2017) signaling mental health problems such as depression (Moreno et al., 2013) or eating disorders (Chancellor et al., 2016).

Existing studies reveal that the viewer's response to the sensitive self-disclosure such as mention of depression and miscarriage (Andalibi, 2017). However, in many cases covered in our study, the individuals at risk did not explicitly solicit help or disclose problems. Therefore, I identify additional signals, such as inconsistency between online and offline personalities, which are often subtle and are detected only by those who know the poster and the context. Rather than relying on a single signal,

our participants synthesized multiple signals via long-term offline and online observation to interpret a friend's state of mind. For instance, a friend's Instagram post about luxury items, often perceived as having the intention of bragging, was a sign of the friend's depression to our participant. This makes it difficult to characterize implicit signals of mental health problems for general use. Thus, peer-supported risk identification feature might be a useful design exploration for integrating peers' knowledge gained from empirical evidence to detect latent symptoms that cannot be captured by algorithm.

Providing Help

When someone suspects his/her friend is experiencing a mental health crisis, reaching out is the first step to providing the help he/she needs to get better. In this study, we could investigate how our participants are reaching out to individuals who seem to have mental health problem by leveraging social media activity. In addition to recognizing friends at risk, peers responded to their friends' signals based on context and personality. One participant's persuasive intervention drove her close friend who was displaying depressive symptoms to a clinical service. Thus, peers can play a key role in mediating between suffering individuals and clinical experts and resources.

Other participant contacts his friends in a timely manner by leveraging social media post implying depressive mood. People who are experiencing a specific emotional crisis (e.g., bipolar disorder) are characterized by a very large change in their emotions, which can quickly endanger themselves. In this situation, peer support can play an important role in recognizing and helping individuals that a psychiatrist or counselor cannot detect.

Implication for supportive social media design

Research has suggested that computational algorithms can model behaviors of the mental health-challenged population using a variety of signals on social media. Our study of peers' perspectives could complement the computational applications by incorporating implicit signals that only another person might recognize and synthesizing these signals to provide appropriate support specific to the individual involved. This study of peers' perspectives allowed us to consider how to augment computational models and interventions by integrating the unique capabilities of human beings, such as contextualized sense-making and sympathy-based communication for persuasion.

Design Opportunities

I suggest that peers' contextualized sense-making abilities could provide insight to advance computational models to recognize individuals who appear to be experiencing mental health problems. Furthermore, peers' special capabilities, such as persuasive powers, could help friends at risk become aware of their mental health conditions and could reduce barriers to help-seeking. I recognize,

however, that the nature of social media presents some challenges to supporting individuals who are displaying mental health issues. Thus, I discuss opportunities for peers when using social media as a supportive platform.

Reducing the visibility of support

This research demonstrated that the high visibility of interactions on social media was one of the reasons peers were reluctant to act. Many participants reported that they felt uncomfortable responding to posts that displayed mental health problems because of the public nature of social media. Thus, supportive ways of interaction need to be designed to reduce the likelihood of broadcasting responses to sensitive disclosures. Making comments or likes available only to the discloser and hiding those activities from publicly available tickers or news feeds, could be one way to reduce supporters' concerns about broadcasting these responses.

Direct communication through private messages or phone calls is often considered useful, but some participants felt reluctant to initiate communication with someone displaying a mental health issue because they lacked confidence in their abilities to provide the appropriate support. Rather than urging peers to take direct action to interact with a discloser, we could propose an indirect mechanism to support the individual through collective action. Peers could develop a shared perception and capacity to recognize risk behavior through shared effort and belief (Vassilev et al., 2014). If collectively gathered concerns were frequently reported by multiple peers over a short-term period or if the number of concerns exceeded a certain threshold, the system could nudge peers to offer care to the discloser. However, designers should be aware of the possibility of a poster's feeling stigmatized or evaluated by peers.

Reducing social stigma

Our study reveals that individual's disclosure of such negative aspects could lead to a negative stereotype or a fixed identity for the poster as someone who is always depressed. This negative perception also one of the reason peers were reluctant to act. Participants reported that such stigma often led them to "unfollow" or even to end a friendship with the poster. This "Unfollow" will result in the poster being unable to receive proper help.

Therefore, providing information that can reduce negative prejudice and social stigma on mental health problems are also considered important for designing social support feature. Prior studies reveal that education (increasing basic understanding of the condition) and social contact (humanizing or 'putting a face' to the condition) are important factors for lowering social stigma (Corrigan and Penn, 1999). For example, visualizing the potential proportion of depression in a user's online social network (Haimson et al., 2014) could be an example. This helps to reduce stigma and negative

stereotypes by allowing people to realize that depression is a disease that many people are currently experiencing and that they are also around me.

Customized alerts for a dedicated supporter

While many participants did not respond actively to social media posts containing mental health problems, some of the dedicate participants were actively using social media to constantly monitor and intervene. Moreover, they were providing help in a timely manner. For example, one participant contacted her friend who is suffering from anorexia right after her friend posted a vast number of food images on the Instagram.

I suggest design opportunity for dedicate peers actively using social media as a tool for nearly real-time detection of risk signals in their friends' posts. These signals were likely to be detected by only a person who knows the history or personality of the friend. For these dedicated peers, I could suggest the fine-tune notification alerting social media activities of a person they are taking care of. For example, a dedicated supporter can turn on notifications for a close friend's irregular activities (e.g., posting time, volume, and contents). Then, an alarm is sent to the supporter when a certain social media activity of the friend occurs. A person who has mental illness can be in dangerous situation unexpectedly due to the changes of mood in a very short time. Therefore, the system that can help dedicated supporters could help peers to help others in a timely manner to prevent the dangerous situation.

7

Conclusion

Conclusion

The goal of this study was to examine peers' perspectives on providing social support for individuals who display mental health problems on social media. The characterization of social media posts and activities related to negative, sensitive disclosures illuminated the key signals that peers perceived. Our results show that peers synthesize multiple signals gained both offline and online to recognize an individual's mental health condition and further to help them in an appropriate time and manner. However, this study also reveals that a considerably large number of peers do not provide support due to practical or emotional challenges resulting from fatigue, social stigma, susceptibility, and visibility. These challenges led us to propose a set of design opportunities for augmenting social media as a supportive platform by fostering collective action in an invisible space for peer supporters. I acknowledge that this study could be complemented by interviews with individuals who experience mental health issues. While our main study target was a student population, I recruited students from different universities to achieve diversity in the participant group. However, I conducted this study in a single country, Korea, thus the generalizability of our work could be limited. I acknowledge that cultural background may impact how participants perceive mental health or social support. Therefore, further studies should investigate how cultural differences impact peer perception and support activities.

References

1. Kopper, B. A., & Epperson, D. L. (1996). The experience and expression of anger: Relationships with gender, gender role socialization, depression, and mental health functioning. *Journal of Counseling Psychology*, 43(2), 158.
2. Andalibi, N., Öztürk, P., & Forte, A. (2017, February). Sensitive Self-disclosures, Responses, and Social Support on Instagram: The Case of# Depression. In *CSCW* (pp. 1485-1500).
3. Baikie, K. A., Geerligs, L., & Wilhelm, K. (2012). Expressive writing and positive writing for participants with mood disorders: An online randomized controlled trial. *Journal of Affective Disorders*, 136(3), 310-319.
4. Barney, L. J., Griffiths, K. M., Jorm, A. F., & Christensen, H. (2006). Stigma about depression and its impact on help-seeking intentions. *Australian & New Zealand Journal of Psychiatry*, 40(1), 51-54.
5. Baxter, L. A., & Montgomery, B. M. (1996). *Relating: Dialogues and dialectics*. Guilford Press.
6. Bazarova, N. N., & Choi, Y. H. (2014). Self-disclosure in social media: Extending the functional approach to disclosure motivations and characteristics on social network sites. *Journal of Communication*, 64(4), 635-657.
7. Bazarova, N. N., Choi, Y. H., Schwanda Sosik, V., Cosley, D., & Whitlock, J. (2015, February). Social sharing of emotions on Facebook: Channel differences, satisfaction, and replies. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (pp. 154-164). ACM.
8. Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S. M., & Olsson, M. (2008). Mental health of college students and their non-college-attending peers: results from the national epidemiologic study on alcohol and related conditions. *Archives of general psychiatry*, 65(12), 1429-1437.
9. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
10. Burke, M., & Kraut, R. E. (2016). The relationship between Facebook use and well-being depends on communication type and tie strength. *Journal of Computer-Mediated Communication*, 21(4), 265-281.
11. Burke, M., Kraut, R., & Williams, D. (2010, February). Social use of computer-mediated communication by adults on the autism spectrum. In *Proceedings of the 2010 ACM conference on Computer supported cooperative work* (pp. 425-434). ACM.
12. Burke, M., Marlow, C., & Lento, T. (2010, April). Social network activity and social well-being. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1909-1912). ACM.
13. Chancellor, S., Kalantidis, Y., Pater, J. A., De Choudhury, M., & Shamma, D. A. (2017, May). Multimodal Classification of Moderated Online Pro-Eating Disorder Content. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 3213-3226). ACM.
14. Chancellor, S., Pater, J. A., Clear, T., Gilbert, E., & De Choudhury, M. (2016, February). #thyghgapp: Instagram content moderation and lexical variation in pro-eating disorder communities. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (pp. 1201-1213). ACM.

15. Choi, S. Y., Venetis, M. K., Greene, K., Magsamen-Conrad, K., Checton, M. G., & Banerjee, S. C. (2016). Planning a stigmatized nonvisible illness disclosure: Applying the Disclosure Decision-Making Model. *The Journal of psychology*, 150(8), 1004-1025.
16. De Choudhury, M., & De, S. (2014, June). Mental Health Discourse on reddit: Self-Disclosure, Social Support, and Anonymity. In ICWSM.
17. De Choudhury, M., & Kıcıman, E. (2017, May). The language of social support in social media and its effect on suicidal ideation risk. In *Proceedings of the... International AAAI Conference on Weblogs and Social Media*. International AAAI Conference on Weblogs and Social Media (Vol. 2017, p. 32). NIH Public Access.
18. De Choudhury, M., Gamon, M., Counts, S., & Horvitz, E. (2013). Predicting Depression via Social Media. *ICWSM*, 13, 1-10.
19. Collins, N. L., & Miller, L. C. (1994). Self-disclosure and liking: a meta-analytic review. *Psychological bulletin*, 116(3), 457.
20. Forgas, J. P. (2011). Affective influences on self-disclosure: mood effects on the intimacy and reciprocity of disclosing personal information. *Journal of personality and social psychology*, 100(3), 449.
21. Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The experiences in close relationships—Relationship Structures Questionnaire: A method for assessing attachment orientations across relationships. *Psychological assessment*, 23(3), 615.
22. Frison, E., & Eggermont, S. (2016). Exploring the relationships between different types of Facebook use, perceived online social support, and adolescents' depressed mood. *Social Science Computer Review*, 34(2), 153-171.
23. Gkotsis, G., Oellrich, A., Velupillai, S., Liakata, M., Hubbard, T. J., Dobson, R. J., & Dutta, R. (2017). Characterisation of mental health conditions in social media using Informed Deep Learning. *Scientific Reports*, 7, 45141.
24. Jashinsky, J., Burton, S. H., Hanson, C. L., West, J., Giraud-Carrier, C., Barnes, M. D., & Argyle, T. (2014). Tracking suicide risk factors through Twitter in the US. *Crisis*.
25. Kessler, R. C., Amminger, G. P., Aguilar-Gaxiola, S., Alonso, J., Lee, S., & Ustun, T. B. (2007). Age of onset of mental disorders: a review of recent literature. *Current opinion in psychiatry*, 20(4), 359.
26. Kim, H. (2014). Enacted social support on social media and subjective well-being. *International Journal of Communication*, 8, 21.
27. Koc, M., & Gulyagci, S. (2013). Facebook addiction among Turkish college students: the role of psychological health, demographic, and usage characteristics. *Cyberpsychology, Behavior, and Social Networking*, 16(4), 279-284.
28. Kramer, A. D., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences*, 111(24), 8788-8790.
29. Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., ... & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS one*, 8(8), e69841.
30. O'Leary, K., Bhattacharya, A., Munson, S. A., Wobbrock, J. O., & Pratt, W. (2017, February). Design Opportunities for Mental Health Peer Support Technologies. In *CSCW* (pp. 1470-1484).

31. Lerman, B. I., Lewis, S. P., Lumley, M., Grogan, G. J., Hudson, C. C., & Johnson, E. (2016). Teen Depression Groups on Facebook: A Content Analysis. *Journal of Adolescent Research*, 0743558416673717.
32. Smith, L., Hill, N., & Kokanovic, R. (2015). Experiences of depression, the role of social support and its impact on health outcomes. *Journal of mental health*, 24(6), 342-346.
33. Melling, B., & Houguet-Pincham, T. (2011). Online peer support for individuals with depression: A summary of current research and future considerations. *Psychiatric rehabilitation journal*, 34(3), 252.
34. Mikulincer, M., & Nachshon, O. (1991). Attachment styles and patterns of self-disclosure. *Journal of personality and social psychology*, 61(2), 321.
35. Moir, F., Henning, M., Hassed, C., Moyes, S. A., & Elley, C. R. (2016). A peer-support and mindfulness program to improve the mental health of medical students. *Teaching and learning in medicine*, 28(3), 293-302.
36. Moncur, W. (2013, April). The emotional wellbeing of researchers: considerations for practice. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1883-1890). ACM.
37. Moore, D., Ayers, S., & Drey, N. (2016). A thematic analysis of stigma and disclosure for perinatal depression on an online forum. *JMIR mental health*, 3(2).
38. Moreno, M. A., Jelenchick, L. A., Egan, K. G., Cox, E., Young, H., Gannon, K. E., & Becker, T. (2011). Feeling bad on Facebook: Depression disclosures by college students on a social networking site. *Depression and anxiety*, 28(6), 447-455.
39. Moreno, M. A., Kelleher, E., & Pumper, M. (2013). Evaluating displayed depression symptoms on social media sites. *Social Networking*, 2(04), 185.
40. Park, S., Kim, I., Lee, S. W., Yoo, J., Jeong, B., & Cha, M. (2015, February). Manifestation of depression and loneliness on social networks: a case study of young adults on Facebook. In *Proceedings of the 18th ACM conference on computer supported cooperative work & social computing* (pp. 557-570). ACM.
41. Pater, J., & Mynatt, E. D. (2017, February). Defining Digital Self-Harm. In *CSCW* (pp. 1501-1513).
42. Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: mental health problems and treatment considerations. *Academic Psychiatry*, 39(5), 503-511.
43. Powell, J., & Clarke, A. (2007). Investigating internet use by mental health service users: interview study. In *Medinfo 2007: Proceedings of the 12th World Congress on Health (Medical) Informatics; Building Sustainable Health Systems* (p. 1112). IOS Press.
44. Prosser, J. L. (2015). *Under Pressure? The Relationship between Reciprocity, Intimacy, and Obligation in Self-Disclosure* (Doctoral dissertation, University of Dayton).
45. Chancellor, S., Lin, Z., Goodman, E. L., Zerwas, S., & De Choudhury, M. (2016, February). Quantifying and predicting mental illness severity in online pro-eating disorder communities. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (pp. 1171-1184). ACM.
46. Vassilev, I., Rogers, A., Kennedy, A., & Koetsenruijter, J. (2014). The influence of social networks on self-management support: a metasynthesis. *BMC public health*, 14(1), 719.

47. Vitak, J., & Kim, J. (2014, February). You can't block people offline: Examining how Facebook's affordances shape the disclosure process. In Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing (pp. 461-474). ACM.
48. Wang, Y., Leon, P. G., Acquisti, A., Cranor, L. F., Forget, A., & Sadeh, N. (2014, April). A field trial of privacy nudges for facebook. In Proceedings of the 32nd annual ACM conference on Human factors in computing systems (pp. 2367-2376). ACM.
49. Wang, Y. C., Kraut, R. E., & Levine, J. M. (2015). Eliciting and receiving online support: using computer-aided content analysis to examine the dynamics of online social support. *Journal of medical Internet research*, 17(4).
50. Webb, M., Burns, J., & Collin, P. (2008). Providing online support for young people with mental health difficulties: challenges and opportunities explored. *Early intervention in psychiatry*, 2(2), 108-113.
51. Andalibi, N. (2017, May). Self-disclosure and Response Behaviors in Socially Stigmatized Contexts on Social Media: The Case of Miscarriage. In Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems (pp. 248-253). ACM.
52. Haimson, O. L., Ringland, K., Simpson, S., & Wolf, C. T. (2014). Using depression analytics to reduce stigma via social media: BlueFriends. *iConference 2014 (Social Media Expo)*.
53. Corrigan, P. W., & Penn, D. L. (1999). Lessons from social psychology on discrediting psychiatric stigma. *American Psychologist*, 54(9), 765.

Appendices

Interview questionnaires

- **인사, 프로젝트 소개, 동의서 작성**
 - 설문을 진행하면서 느꼈던 점이나 들었던 생각에 대해 얘기해주세요
 - *Preamble 설명 및 동의
- **참가자 배경 조사**
 - 사용하시는 SNS 서비스에는 어떤 것들이 있나요?
 - 각각의 주된 사용 목적은 어떻게 되시나요?
 - 본인 혹은 주변인이 정신건강 문제를 겪어본 적이 있었는가요?
 - 알고 계신 정신건강 질환, 문제는 어떠한 것들이 있나요?
 - 치료법, 증상, 주변인의 역할에 대해 알고 계신 것들이 있나요?
- **게시물에 대한 판단과 본인의 반응, 영향**
 - **경험 묘사** : 기억나는 경험들에 대해 자세히 알려주세요
 - 게시물에 대해 구체적으로 묘사해주세요
 - 가능하면 보여주실 수 있을까요?
 - (기억이 나지 않거나, 민감한 내용의 경우 설문자 혼자 보면서 말로 묘사해 달라고 부탁)
 - **작성자에 대한 생각 / 마음** : 작성자에 대한 친밀도 및 감정 인식
 - (친밀도) 작성자와는 어떤 관계인가요?
 - 게시자와의 관계가 자신의 반응에 어떤 영향을 미치나요?
 - 게시물을 접했을 때, 작성자에 대해 어떤 생각/마음이 들었나요?
 - 작성자와 오프라인에서도 만났다면, SNS 에서와 다른 모습이 있나요?
 - 어떤 생각이 들었나요?
 - **피험자 논리(판단과정)** : 판단, 반응까지 이르게 된 과정, 근거 들어보기
 - 게시물을 왜 올렸다고 생각하시나요?
 - 게시물을 통해 정신건강이 염려된다고 말씀하셨는데 이유에 대해 자세히 말씀해주세요.
 - (반응) 게시물에 대해 어떤 반응을 보였나요?
 - 다양한 방법 중에서 좋아요 누르기를 택한 이유를 알려줄수 있나요?
 - 게시물에 반응을 하는데 있어 어려움 혹은 부담을 느끼는 요인이 있나요?
 - 게시물은 일시적이었나요? 지속적으로 반복적으로 올라오는 글이었나요?
 - 게시물을 처음 접했을때와, 지속적으로 접했을 때 반응이나 드는 생각의 차이가 있었나요?
 - 본인의 지지 및 지원이 타인에게 어떻게 느껴질 것이라고 생각하시나요?
 - 본인의 경험, 알고 있는 지식이 지지, 지원에 영향을 미치나요?
 - 본인은 이와 같은 지지, 지원을 받아본 경험이 있나요?
 - **피험자 감정 이해: 게시물을 접했을 때, 피험자 본인에게 미치는 영향과 감정**
 - 이러한 게시물을 봤을 때, 본인에게 미치는 영향은 어떠했나요?
 - (영향이 거의 없다고 대답한 경우) 왜 본인에게 아무 영향이 없는지 말씀해 주실 수 있나요?
 - 본인에게 들었던 기분, 감정은 어떠했나요?
 - (trigger) 나 / 게시자 / 주변 사람의 정신건강 문제에 대해 생각해보게 되는지
 - 게시물 내용 혹은 게시자의 상태에 공감이 되는 적이 있었는지?
 - 그래서 적극적으로 도와줄 마음이 들었는지?
- **더 포괄적인 질문 : 기존 sns 에서의 경험, 생각 수집**
 - 어떠한 SNS 에서 정신건강이 염려되는 게시물을 주로 접하시나요?
 - 특정인이 다양한 종류의 SNS 를 사용하기도 하나요?
 - SNS 의 종류에 따라서 게시물의 내용, 분위기, 뉘앙스가 달라지기도 하나요?
 - 주로 어떠한 콘텐츠 타입의 게시물에서 정신건강의 염려를 느끼시나요?
 - (예를 들어 글, 사진, 영상 등)

- 그 외
 - SNS 에서 정신건강 문제로 힘들어하는 친구를 도울 수 있는 방법에 대해서, 생각나는 좋은 아이디어나, 있었으면 하는 기능이 있다면 자유롭게, 아무런 제약 없이 표현해주세요.
- 마무리, 정리
 - 지금까지 진행한 인터뷰 내용과 관련해서 추가하고 싶은 내용이 있으시다면 말씀해주세요

Executive Summary in Korean

Helping Friends Suffering Mental Health Issues: Challenges and Opportunities for Social Support on Social Media from the Peer's Point of View

최근의 연구들은 정신 건강 문제를 호소하는 대학생의 수가 지속해서 증가하고 있음을 보여주고 있다. 이러한 상황에서, 페이스북, 인스타그램과 같은 소셜미디어는 정신건강 문제를 겪는 대학생들이 자신의 어려움을 공개하거나(자기공개, Self-disclosure), 타인에게 도움을 구하고, 받는 공간으로써(동료 지원, peer support) 사용되고 있다. 그러나, 위와 같은 게시물을 접하고, 도움을 제공할 것으로 예상하는 동료(peer)들에 대한 경험과 인식에 대해서는 아직 밝혀진 바가 적다. 우리의 질적 연구는, 어떻게 학생 동료(peer)들이 다른 사람의 정신건강 문제를 인지하고 반응하는지, 동료의 입장에서 현상을 이해해 보고자 연구를 진행하였다. 연구를 통해 우리가 알고 싶은 것은 다음과 같다.

1. 동료들은 소셜미디어 콘텐츠 및 활동을 활용하여 어떻게 친구의 정신건강 문제를 인지하는가?
2. 동료들은 소셜미디어 콘텐츠 및 활동을 활용하여 어떤 방법으로 그들의 친구를 돕고 있는가?
3. 정신건강 상태 또는 이상을 나타내는 소셜미디어 게시물을 보았을 때, 동료에게 미치는 영향은 어떠한가?

위의 질문에 답하기 위하여 우리는 설문과 인터뷰를 진행하였다. 먼저 진행된 설문은 전국 6개 대학에서 227명의 대학생을 대상으로 진행되었다. 설문은 자신의 친구의 정신건강 문제를 인지한 경험에 대해, 그리고 어떠한 반응을 보였는지에 관해 묻는 질문으로 구성되었다. 설문 참가자 대상 중, 20명을 대상으로 진행한 후속 인터뷰에서는, 보다 구체적이고 경험과 생각을 청취하고자 하였다. 약 75%의 설문 참가자는 소셜미디어를 통해 타인의 정신건강 문제를 인지한 적이 있다고 응답하였다. 정신건강 문제를 인지한 활동의 종류는 글, 문장으로 이뤄진 게시글이 약 88%로 가장 높은 부분을 차지하였으며, 그림 사진과 같은 이미지가 5%, 링크 공유와 같은 다른 종류가 7%를 차지하였다. 대부분 참가자는 (약 58%) 이러한 게시물에 반응하지 않았다고 응답하였다. 30%의 참가자들은 “좋아요” 버튼과 같은 공감의 표현으로 반응하였으며, 약 19%의 참가자들은 짧은 댓글을 통해 지지 및 응원의 반응을 표현하였다. 약 7%의 참가자가 친구와의 약속을 잡았으며, 4%의 참가자들은 전문적 도움을 제공하였다. 참가자들은 명시적인 언급 (예, 우울증 또는 우울한 감정에 대한 직접적 언급), 암묵적인

신호, 배경지식 등을 다양하게 활용하여 타인의 정신건강 이상을 인지하고 있음을 확인할 수 있었다. 예를 들어, 참가자들은 온라인과 오프라인에서 다르게 느껴지는 정체성의 차이를 통해 정신건강 문제를 인지하기도 하였다. 약 58%의 참가자가 직접적인 도움을 주고 있지 않았지만, 특정 참가자들은 동료들만이 할 수 있는 도움을 제공하고 있는 모습을 보여주었다. 이러한 동료들은 소셜미디어에서 발견되는 다양한 신호를 활용하여, 친구의 정신건강 상태를 관찰하기도 하였으며, 위험이 감지되는 순간에 시기적절하게 도움을 제공하여주고 있었다. 위와 같은 도움은 감정의 변화가 매우 크고, 순식간에 위험에 빠질 수 있는 특성을 가진 정신건강 문제를 가진 사람에게 큰 도움을 줄 수 있다. 그러나, 정신건강과 관련한 자기 공개로 기인한 사회적 낙인, 피로가, 적극적인 사회적 지원(social support) 가로막고 있음을 본 연구에서 또한 확인할 수 있었다. 더욱이 이러한 부정적 인식과 영향은 동료와 게시자 간의 관계를 끊도록 만들기도 하였다. 이러한 단절은 게시자가 필요한 도움을 받지 못하게 된다는 점에서 위험할 수 있다.

본 연구는 동료가(peer) 소셜미디어를 활용하여, 정신건강 문제를 가지고 있는 타인을 인지하고, 돕는 방법에 대해 발견하였다. 선행연구와의 비교를 통해, 기계학습 또는 연구자들이 인지하는 방법과는 차별화된 동료만의 역할을 발견할 수 있었다. 발견된 내용을 바탕으로 본 연구에서는 소셜미디어에서 동료 지원(peer support) 기능을 설계할 때 고려해야 할 디자인 기회를(design opportunities) 제시한다. 소셜미디어에서 동료들의 사회적 지원을 어렵게 하는 문제를 해결하기 위해 1) 도움의 가시성 감소, 2) 사회적 낙인의 감소를 위한 디자인 기회를 제시하였다. 대부분 참가자가 직접적인 도움을 주고 있지 않았지만, 몇 참가자들은 동료들은 소셜미디어에서 발견되는 다양한 신호를 활용하여 시기적절하게 도움을 제공하여주고 있었다. 우리는 이처럼 소셜미디어를 사회적 지원의 도구로 사용하고 있는 동료들을 지원해 줄 수 있는 디자인 기회를 또한 제공하였다. 이를 위해, 동료가 자신의 친구가 위험한 상황에 있음을 인지할 수 있는 개인화된 알람을 설정할 수 있도록 해주어, 감정과 상태의 기복이 심한 정신건강 문제를 안고 있는 친구를 적시에 도울 수 있는 기능을 제시하였다.

핵심어: 대학생; 정신건강; 소셜미디어; 동료지원; 자기공개; 사회적지지; 정신건강

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2 년의 석사과정 동안, 제가 공부하고 싶었던 HCI 연구를 경험할 수 있도록 기회를 열어 주시고, 의미 있는 주제를 찾아, 바르게 연구할 수 있도록 지도해주신 홍화정 교수님께 감사의 말씀을 올립니다. 기억에 남는 연구를 하자고 말씀하시며, 제가 주도적으로 연구 주제를 찾아 진행할 수 있도록 지도해 주셨습니다. 이러한 과정이 쉽지 않았지만, 많은 고민을 하며 제가 무엇을 공부해야 하는지 스스로 고민할 수 있는 시간이 되었고, 이러한 고민을 통해 제가 성장할 수 있었다고 생각합니다. 또한, 교수님께서 많은 시간과 노력을 들여서 저의 연구를 도와주시는 모습을 보며 많은 감동을 받았습니다. 저의 연구를 저보다 더 꼼꼼하게 챙기시고, 냉철하게 분석하시는 모습을 보며 저도 교수님의 모습과 같은 연구자의 태도로 매사의 일에 임 하고 싶다는 다짐을 하게 되었습니다. 전문적인 지식과 경험을 바탕으로 저의 논문을 심사하여주시고, 앞으로의 진로에 도움이 되는 조언을 주신 박영우 교수님과 정두영 교수님께도 감사의 말씀을 전합니다.

석사과정 동안 DxD 랩 식구들과 함께할 수 있었다는 것은 저에게 큰 행운 이였습니다. 우리 랩 식구들을 돌아보면 어느 한 명 빛나지 않았던 사람이 없었던 것 같습니다. 2 년의 석사과정 동안 동안 누구보다 많은 일을 함께 겪으며, 어려운 일도, 즐거웠던 추억도 함께한 광영이를 통해 많은 힘을 얻을 수 있었습니다, 동생이지만 저보다 더 어른스럽게 자신의 일을 하는 모습을 보며 많은 것을 배울 수 있었습니다. 새로운 시선으로 세상을 바라보고, 자신의 색과 언어로 디자인을 하는 원영이와 예술적인 감성으로 아름다운 인터랙션을 만들어내는 한별이를 보며 많은 영향을 받았습니다. 항상, 옆자리에서 보여주는 연구에 대한 열정과, 따뜻한 말 한마디로 저에게 큰 힘을 주는 민트라에게도 감사하다는 말을 전하고 싶습니다. 주도적으로 학기 동안 자신의 주제를 자기가 가지고 멋지게 하나의 프로젝트를 마치는 학부생 친구들의 작업을 보면서, 저에게는 큰 도전이 되었습니다. 이렇게 귀한 랩 식구들이 때로는 인간적으로, 때로는 학문적으로 서로에게 도움을 주고 힘이 돼 주었던 2 년간의 시간이 저에겐 참으로 감사한 기억으로 남을 것입니다.

CDE 라는 대학원 아래서 모인 각기 다른 곳에서 온 친구 동기들 또한 저에게 너무 큰 힘이 되었습니다. 특히, 유일한 동갑으로 만나, 지칠 때 큰 힘과 용기를 준 명진이를 통해 석사과정을 재미있고 밝게 보낼 수 있었습니다. 그리고 다 적지 못한 우리 모든 동기에게 진심으로 고마움을 전합니다.

못난 아들이지만 저를 끝까지 포기하지 않으시고, 믿어주시는 부모님께 감사하다는 말씀을 전합니다.
동생이지만 저보다 믿음직스럽게 자기의 자리에서 열심히 공부하고 있는 동완이 또한 저에게 큰 힘이
되었습니다. 항상 저를 믿어주시는 할머니, 삼촌, 고모 저희 모든 가족에게도 감사합니다. 마지막으로,
지금까지 짧지 않은 시간 동안 저와 함께해주고, 믿어준 은영이에게도 큰 고마움을 전합니다.

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